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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,793	12/12/2003	Aseem Agrawal	JP920030161US1	3462
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EXAMINER				
HOAR, COLLEEN A				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/734,793

**Applicant(s)**

AGRAWAL ET AL.

**Examiner**

Colleen Hoar

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3-9 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-9, 11-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/21/2009 has been entered.

### ***Status of Claims***

Claims 1, 3-9, 11-18 are pending in the application. Claims 1, 9, 17 are amended. Claims 2, 10, are cancelled. Claims 3-8, 11-16 as previously presented.

### ***Claim Rejections - 35 USC § 112***

Claims 1, 3-9, 11-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The independent claims mention customer activities across multiple channels upon which promotions are targeted and delivered, however it is unclear how a one-way channel such as a catalog or direct marketing can be used in this way.

A response to a direct marketing piece has not been addressed. In addition, when a customer responds to a catalog, he/she does so by switching from the one way catalog

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channel to a telephonic or web channel upon which an offer is made. This subject matter continues to be indefinite.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-7, 9, 12-17, rejected under 35 U.S.C. 102(b) as being anticipated by Abe et al., (6055513) hereinafter referred to as Abe.

Claim 1, 4-7, 9, 12-15,17, Abe discloses **storing** customer transaction data including stimulus-response history data, a **customer profile cache** for receiving an output of the customer transaction cache and storing current customer profile data, and a customer relationship management system, for receiving an output of the customer profile cache and customer relationship management rules, and **execute the action** specified by a rule that is identified as applicable. In this system, for example, the customer relationship management rules may be automatically generated based on the customer transaction data. (Page 3, Para 29); providing customer data may include selecting customer data by accessing a number of channel specific databases, and forming an effective joining of data using a form of **customer identification** as a key. (Page 2-3, Para 25); sequential decision making (e.g., sequential cost-sensitive decision making) for customer relationship management. The inventive method includes providing customer data (e.g., consumer data, client data, donor data, etc.) comprising stimulus-response history data, and automatically generating actionable rules based on

the customer data. Further, automatically generating actionable rules may include **estimating a value function using reinforcement learning** (e.g., reinforcement learning and dynamic programming). For example, **estimating a value function** may include value iteration.(Page 2, Para 14); Further, the actionable rules may be generated using reinforcement learning based on a Markov Decision Process model with function approximation. For example, the batch reinforcement learning with function approximation may be based on Q-learning and/or sarsa-learning. For example, the batch reinforcement learning may be based on training data including sequences of states, actions, and resulting rewards. (Page 2, Para 17) using the customer data **to output instance-in-time targeting rules [before executing said request]**(Page 2, Para 18) Further, the inventive method may be applied to **cross-channel optimized marketing (CCOM)**. For example, the inventive method may include providing customer data including stimulus-response history data from a plurality of channels (e.g., "multiple" channels), **integrating the customer data, and automatically generating channel specific actionable rules based on the customer data.** For instance, in this case the method may optimize (e.g., nearly optimize) cross-channel cumulative profits.(Page 2, Para 19); providing customer data may include generating a sequence of event data which may include a **customer's demographic features, and features, derived from the customer's stimulus-response history data, which collectively reflect the state of said customer at a certain point in time, an action (e.g., a marketing action) taken at or around that time by an entity (e.g., a seller such as a retailer), a response taken by the customer at or around a time of an event,** (Page

2, Para 20); optimization of sequences of marketing actions, as now the **actions are not only taken at different points in time, but also across different channels over time.** (Page 12, Para 179); FIG. 24 illustrates one possible infrastructure for the present invention including Cross Channel Optimized Marketing. For example, **in this example, the channels include the web, kiosk, direct mail, a call center, and a store. The rules from the customer relationship management (CRM) rule base are applied to operational transactions [ requests and replies] to transform into customer profiles (e.g., operational and historical) at a point in time. The customer lifetime value is modeled to predict customer behavior. These models are transformed into situation-action rules which may be used to update the CRM rule base.** (Page 14, Para 197); Further, blocks 1560,1565,1575, and 1580 represent an exemplary embodiment of an operational CRM system for utilizing the targeting rules that are produced by the invention. **This operational CRM system is depicted as having its own transaction (1580) and profile (1565) data caches in order to enhance its run-time execution speed** by reducing the number of queries that would otherwise have to be issued against the main database (1505) if the data caches were not present.(Page 12 ,Para 177); The system 1400 also includes a processor 1420 for **automatically generating actionable (e.g., targeting) rules based on the customer data.** (Page 12, Para 167); Further, providing customer data may include selecting customer data. For example, a **value estimation** may repeatedly call a data selection module one or more times per each iteration of a value iteration. In addition, the data selection module may access a customer and transaction history data set stored in a data storage device, and

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use a selection criteria to select a restricted subset for use in a **value function estimation** (Page 2, Para 23).[Examiner equates a value estimation to a belief or probability assignment of a customer action as applied in calculations and algorithms of the reference.]

Claim 8, 16, Abe discloses **As** each action is performed, Equation 5 is first used to **update** the Q-value for the state just visited, and Equation 6 is then used to update the action that is to be taken (**with probability**  $(1-E)$ ) the next time that state is visited.(Page , Para 91).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 11, 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Abe in view of Reiser et al. (6125339).

Claims 3, 11, 18 : Abe discloses a customer relationship system that integrates customer profiles across multiple channels and generates operational rules for upselling, promotions, offers, etc. using statistical processes such as Markov Decision Process, regression analysis, Sarsa-learning, Q-learning. Abe does not explicitly mention Dempster Orthogonal Sum belief processes, however, this approach is a basic probability assignment process which is an approach taken by the Abe invention. Reiser teaches the Dempster-Schafer belief process, - a method of fuzzy logic for automatically learning belief functions "including the steps of gathering information representative of an object or event; creating a set of basic probability assignments based on said set of information; creating combinations of said basic probability assignments; measuring an error present in said basic probability assignments and said combinations of basic probability assignments; **calculating updates** of said basic probability assignments and said combinations of basic probability assignments based



on said error; and **modifying said basic probability assignments and said combinations of basic probability assignments with said updates.** (Col 2, lines 6-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Abe to use the Dempster-Shafer basic probability assignment method in order to predict which promotion or upsell is most likely to be accepted by a customer.

### ***Response to Arguments***

Applicant's arguments filed January 29, 2009 then repeated on 8/4/2009 have been fully considered but they are not persuasive.

Applicant argues that (re: the 112 rejection) examiner is reading limitations into the claim. Examiner disagrees. Examiner is confused how the (claimed) catalog or the (claimed) direct marketing can be used as a two-way channel as applicant states. Examiner is not however confused how an on-line computer can be used to accomplish 2-way communications.

Abe references multiple behavior profiles or multiple channels to generate channel specific offers using various statistical and probability processes to make a prediction. In addition, Abe discloses simulating online reinforcement learning with a particular policy by electing to use just those data that conform to the policy.(Page 8, Para 110) and therefore anticipates applicant. Therefore, the inventors have developed cross-channel optimized marketing (CCOM) technology. Specifically, as shown in FIG. 19, the inventors are developing CCOM for customer lifetime value maximizing by

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addressing at least three core technical issues, (1) scalability for integrating large multi-channel data, (2) optimizing rules across multiple channels and over customer's life time, and (3) mapping rules into channel-specific actions.

A key feature of the present invention (e.g., including CCOM) is that it achieves desired cross-channel customer behavior via optimized channel-specific targeted marketing rules. For instance, the present invention may leverage cross-channel historical data on customer buying behavior, channel behavior, and promotion-response behavior. Further, it may automatically generate channel specific targeting rules, optimized across all channels. In addition, it may automatically generate *instance-in-time targeting rules* [before executing said request], optimized for sequence of targeting actions. (Page 13, Para 192-193). The invention of Abe overcomes dealing with large data histories for each transaction and therefore anticipates reinforcement learning online.

Reiser uses the Dempster Orthogonal Sum approach for combining data from different sources to make a prediction which includes updating said probability assignments from those stored in history among multiple combinations [ *or channels*]. This is an obvious substitution algorithms included in Abe.

Applicant has not materially adjusted claims nor arguments therefore Examiner's response remains as before.

***Conclusion***

This is a continued examination of applicant's earlier Application No. 10734793. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen Hoar whose telephone number is (571)270-3447. The examiner can normally be reached on Monday- Thursday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Stamber can be reached on 571-272-6724. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey D. Carlson/  
Primary Examiner, Art Unit 3622

Colleen Hoar  
Examiner  
Art Unit 3622

/C. H./ 12/18/2009  
Examiner, Art Unit 3622